





Pubmed Nucleotide Protein Genome Structure PMC Taxonomy OMIM Books

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Range: from  to  Features: ☐ SNP ☒ CDD ☒ HPRD

☐ 1: NP\_000537. Reports tumor protein p53...[gi:8400738]

BLink, Conserved  
Domains, Links

**Comment Features Sequence**

LOCUS NP\_000537 393 aa linear PRI 31-OCT-2000

DEFINITION tumor protein p53 [Homo sapiens].

ACCESSION NP\_000537

VERSION NP\_000537.2 GI:8400738

DBSOURCE REFSEQ: accession NM\_000546.2

KEYWORDS .

SOURCE Homo sapiens (human)

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 Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.

REFERENCE 1 (sites)

AUTHORS Radhakrishnan, S.K. and Gartel, A.L.

TITLE CDK9 phosphorylates p53 on serine residues 33, 315 and 392

JOURNAL Cell Cycle 5 (5), 519-521 (2006)

PUBMED 16552184

REFERENCE 2 (sites)

AUTHORS Yeh, F.Y., Chuang, S.E., Yeh, K.H., Song, Y.C., Chang, L.L. and Cheng, A.L.

TITLE Phosphorylation of p53 on Thr55 by ERK2 is necessary for doxorubicin-induced p53 activation and cell death

JOURNAL Oncogene 23 (20), 3580-3588 (2004)

PUBMED 15116093

REFERENCE 3 (sites)

AUTHORS Wang, Y.H., Tsay, Y.G., Tan, B.C., Lo, W.Y. and Lee, S.C.

TITLE Identification and characterization of a novel p300-mediated p53 acetylation site, lysine 305

JOURNAL J. Biol. Chem. 278 (28), 25568-25576 (2003)

PUBMED 12724314

REFERENCE 4 (sites)

AUTHORS Uhle, S., Medalia, O., Waldron, R., Dumdey, R., Henklein, P., Bech-Otschir, D., Huang, X., Berse, M., Sperling, J., Schade, R. and Dubiel, W.

TITLE Protein kinase CK2 and protein kinase D are associated with the COP9 signalosome

JOURNAL EMBO J. 22 (6), 1302-1312 (2003)

PUBMED 12628923

REFERENCE 5 (sites)

AUTHORS Li, M., Luo, J., Brooks, C.L. and Gu, W.

TITLE Acetylation of p53 inhibits its ubiquitination by Mdm2

JOURNAL J. Biol. Chem. 277 (52), 50607-50611 (2002)

PUBMED 12421820

REFERENCE 6 (sites)

AUTHORS Xie, S., Wu, H., Wang, Q., Kunicki, J., Thomas, R. O., Hollingsworth, R. E., Cogswell, J. and Dai, W.

TITLE Genotoxic stress-induced activation of Plk3 is partly mediated by Chk2

JOURNAL Cell Cycle 1 (6), 424-429 (2002)

PUBMED 12548019

REFERENCE 7 (sites)

AUTHORS Bahassi el, M., Conn, C. W., Myer, D. L., Hennigan, R. F., McGowan, C. H., Sanchez, Y. and Stambrook, P. J.

TITLE Mammalian Polo-like kinase 3 (Plk3) is a multifunctional protein involved in stress response pathways

JOURNAL Oncogene 21 (43), 6633-6640 (2002)

PUBMED 12242661

REFERENCE 8 (sites)

AUTHORS Kim, S. J., Hwang, S. G., Shin, D. Y., Kang, S. S. and Chun, J. S.

TITLE p38 kinase regulates nitric oxide-induced apoptosis of articular chondrocytes by accumulating p53 via NFkappa B-dependent transcription and stabilization by serine 15 phosphorylation

JOURNAL J. Biol. Chem. 277 (36), 33501-33508 (2002)

PUBMED 12091386

REFERENCE 9 (sites)

AUTHORS Jabbur, J. R. and Zhang, W.

TITLE p53 Antiproliferative function is enhanced by aspartate substitution at threonine 18 and serine 20

JOURNAL Cancer Biol. Ther. 1 (3), 277-283 (2002)

PUBMED 12432277

REFERENCE 10 (sites)

AUTHORS Saito, S., Goodarzi, A. A., Higashimoto, Y., Noda, Y., Lees-Miller, S. P., Appella, E. and Anderson, C. W.

TITLE ATM mediates phosphorylation at multiple p53 sites, including Ser(46), in response to ionizing radiation

JOURNAL J. Biol. Chem. 277 (15), 12491-12494 (2002)

PUBMED 11875057

REFERENCE 11 (sites)

AUTHORS Zhang, J., Krishnamurthy, P. K. and Johnson, G. V.

TITLE Cdk5 phosphorylates p53 and regulates its activity

JOURNAL J. Neurochem. 81 (2), 307-313 (2002)

PUBMED 12064478

REFERENCE 12 (sites)

AUTHORS Barcia, R., Lopez-Borges, S., Vega, F. M. and Lazo, P. A.

TITLE Kinetic properties of p53 phosphorylation by the human vaccinia-related kinase 1

JOURNAL Arch. Biochem. Biophys. 399 (1), 1-5 (2002)

PUBMED 11883897

REFERENCE 13 (sites)

AUTHORS D'Orazi, G., Cecchinelli, B., Bruno, T., Manni, I., Higashimoto, Y., Saito, S., Gostissa, M., Coen, S., Marchetti, A., Del Sal, G., Piaggio, G., Fanciulli, M., Appella, E. and Soddu, S.

TITLE Homeodomain-interacting protein kinase-2 phosphorylates p53 at Ser 46 and mediates apoptosis

JOURNAL Nat. Cell Biol. 4 (1), 11-19 (2002)

PUBMED 11780126

REFERENCE 14 (sites)

AUTHORS Xie, S., Wu, H., Wang, Q., Cogswell, J. F., Husain, I., Conn, C., Stambrook, P., Jhanwar-Uniyal, M. and Dai, W.

TITLE Plk3 functionally links DNA damage to cell cycle arrest and apoptosis at least in part via the p53 pathway

JOURNAL J. Biol. Chem. 276 (46), 43305-43312 (2001)

PUBMED 11551930

REFERENCE 15 (sites)

AUTHORS Vaziri,H., Dessain,S.K., Ng Eaton,E., Imai,S.I., Frye,R.A., Pandita,T.K., Guarente,L. and Weinberg,R.A.  
 TITLE hSIR2 (SIRT1) functions as an NAD-dependent p53 deacetylase  
 JOURNAL Cell 107 (2), 149-159 (2001)  
 PUBMED 11672523  
 REFERENCE 16 (sites)

AUTHORS Latonen,L., Taya,Y. and Laiho,M.  
 TITLE UV-radiation induces dose-dependent regulation of p53 response and modulates p53-HDM2 interaction in human fibroblasts  
 JOURNAL Oncogene 20 (46), 6784-6793 (2001)  
 PUBMED 11709713  
 REMARK Erratum:[Oncogene 2001 Dec 6;20(56):8165]  
 REFERENCE 17 (sites)

AUTHORS Yeh,P.Y., Chuang,S.E., Yeh,K.H., Song,Y.C. and Cheng,A.L.  
 TITLE Nuclear extracellular signal-regulated kinase 2 phosphorylates p53 at Thr55 in response to doxorubicin  
 JOURNAL Biochem. Biophys. Res. Commun. 284 (4), 880-886 (2001)  
 PUBMED 11409876  
 REFERENCE 18 (sites)

AUTHORS Kwek,S.S., Derry,J., Tyner,A.L., Shen,Z. and Gudkov,A.V.  
 TITLE Functional analysis and intracellular localization of p53 modified by SUMO-1  
 JOURNAL Oncogene 20 (20), 2587-2599 (2001)  
 PUBMED 11420669  
 REFERENCE 19 (sites)

AUTHORS Buschmann,T., Potapova,O., Bar-Shira,A., Ivanov,V.N., Fuchs,S.Y., Henderson,S., Fried,V.A., Minamoto,T., Alarcon-Vargas,D., Pincus,M.R., Gaarde,W.A., Holbrook,N.J., Shiloh,Y. and Ronai,Z.  
 TITLE Jun NH2-terminal kinase phosphorylation of p53 on Thr-81 is important for p53 stabilization and transcriptional activities in response to stress  
 JOURNAL Mol. Cell. Biol. 21 (8), 2743-2754 (2001)  
 PUBMED 11283254  
 REFERENCE 20 (sites)

AUTHORS Turenne,G.A. and Price,B.D.  
 TITLE Glycogen synthase kinase3 beta phosphorylates serine 33 of p53 and activates p53's transcriptional activity  
 JOURNAL BMC Cell Biol. 2, 12 (2001)  
 PUBMED 11483158  
 REFERENCE 21 (sites)

AUTHORS Nakamura,S., Roth,J.A. and Mukhopadhyay,T.  
 TITLE Multiple lysine mutations in the C-terminal domain of p53 interfere with MDM2-dependent protein degradation and ubiquitination  
 JOURNAL Mol. Cell. Biol. 20 (24), 9391-9398 (2000)  
 PUBMED 11094089  
 REFERENCE 22 (sites)

AUTHORS Rodriguez,M.S., Desterro,J.M., Lain,S., Lane,D.P. and Hay,R.T.  
 TITLE Multiple C-terminal lysine residues target p53 for ubiquitin-proteasome-mediated degradation  
 JOURNAL Mol. Cell. Biol. 20 (22), 8458-8467 (2000)  
 PUBMED 11046142  
 REFERENCE 23 (sites)

AUTHORS Lopez-Borges,S. and Iazo,P.A.  
 TITLE The human vaccinia-related kinase 1 (VRK1) phosphorylates threonine-18 within the mdm-2 binding site of the p53 tumour suppressor protein  
 JOURNAL Oncogene 19 (32), 3656-3664 (2000)  
 PUBMED 10951572  
 REFERENCE 24 (sites)

AUTHORS Luciani,M.G., Hutchins,J.R., Zheleva,D. and Hupp,T.R.

**TITLE** The C-terminal regulatory domain of p53 contains a functional docking site for cyclin A

**JOURNAL** J. Mol. Biol. 300 (3), 503-518 (2000)

**PUBMED** [10884347](#)

**REFERENCE** 25 (sites)

**AUTHORS** Sayed,M., Kim,S.O., Salh,B.S., Issinger,O.G. and Pelech,S.L.

**TITLE** Stress-induced activation of protein kinase CK2 by direct interaction with p38 mitogen-activated protein kinase

**JOURNAL** J. Biol. Chem. 275 (22), 16569-16573 (2000)

**PUBMED** [10747897](#)

**REFERENCE** 26 (sites)

**AUTHORS** Shieh,S.Y., Ahn,J., Tamai,K., Taya,Y. and Prives,C.

**TITLE** The human homologs of checkpoint kinases Chk1 and Cds1 (Chk2) phosphorylate p53 at multiple DNA damage-inducible sites

**JOURNAL** Genes Dev. 14 (3), 289-300 (2000)

**PUBMED** [10673501](#)

**REMARK** Erratum:[Genes Dev 2000 Mar 15;14(6):750]

**REFERENCE** 27 (sites)

**AUTHORS** Li,L., Ljungman,M. and Dixon,J.E.

**TITLE** The human Cdc14 phosphatases interact with and dephosphorylate the tumor suppressor protein p53

**JOURNAL** J. Biol. Chem. 275 (4), 2410-2414 (2000)

**PUBMED** [10644693](#)

**REFERENCE** 28 (sites)

**AUTHORS** Dumaz,N., Milne,D.M. and Meek,D.W.

**TITLE** Protein kinase CK1 is a p53-threonine 18 kinase which requires prior phosphorylation of serine 15

**JOURNAL** FEBS Lett. 463 (3), 312-316 (1999)

**PUBMED** [10606744](#)

**REFERENCE** 29 (sites)

**AUTHORS** Cuddihy,A.R., Wong,A.H., Tam,N.W., Li,S. and Koromilas,A.E.

**TITLE** The double-stranded RNA activated protein kinase PKR physically associates with the tumor suppressor p53 protein and phosphorylates human p53 on serine 392 in vitro

**JOURNAL** Oncogene 18 (17), 2690-2702 (1999)

**PUBMED** [10348343](#)

**REFERENCE** 30 (sites)

**AUTHORS** Liu,L., Scolnick,D.M., Trievel,R.C., Zhang,H.B., Marmorstein,R., Halazonetis,T.D. and Berger,S.L.

**TITLE** p53 sites acetylated in vitro by PCAF and p300 are acetylated in vivo in response to DNA damage

**JOURNAL** Mol. Cell. Biol. 19 (2), 1202-1209 (1999)

**PUBMED** [9891054](#)

**REFERENCE** 31 (residues 1 to 393)

**AUTHORS** Tortora,V., Bontempo,F., Verdicchio,M., Armetta,I., Abbondanza,C., Schiavone,E.M., Nola,E., Puca,G.A. and Molinari,A.M.

**TITLE** Regulation of p53 function in normal and malignant cells

**JOURNAL** Adv. Exp. Med. Biol. 472, 89-100 (1999)

**PUBMED** [10736619](#)

**REFERENCE** 32 (sites)

**AUTHORS** Giaccia,A.J. and Kastan,M.B.

**TITLE** The complexity of p53 modulation: emerging patterns from divergent signals

**JOURNAL** Genes Dev. 12 (19), 2973-2983 (1998)

**PUBMED** [9765199](#)

**REFERENCE** 33 (sites)

**AUTHORS** Sakaguchi,K., Herrera,J.E., Saito,S., Miki,T., Bustin,M., Vassilev,A., Anderson,C.W. and Appella,E.

**TITLE** DNA damage activates p53 through a phosphorylation-acetylation cascade

JOURNAL Genes Dev. 12 (18), 2831-2841 (1998)  
 PUBMED 9744860  
 REFERENCE 34 (sites)  
 AUTHORS Youmell,M., Park,S.J., Basu,S. and Price,B.D.  
 TITLE Regulation of the p53 protein by protein kinase C alpha and protein kinase C zeta

JOURNAL Biochem. Biophys. Res. Commun. 245 (2), 514-518 (1998)  
 PUBMED 9571186  
 REFERENCE 35 (sites)  
 AUTHORS Okorokov,A.L., Ponchel,F. and Milner,J.  
 TITLE Induced N- and C-terminal cleavage of p53: a core fragment of p53, generated by interaction with damaged DNA, promotes cleavage of the N-terminus of full-length p53, whereas ssDNA induces C-terminal cleavage of p53

JOURNAL EMBO J. 16 (19), 6008-6017 (1997)  
 PUBMED 9312058  
 REFERENCE 36 (sites)  
 AUTHORS Gu,W. and Roeder,R.G.  
 TITLE Activation of p53 sequence-specific DNA binding by acetylation of the p53 C-terminal domain

JOURNAL Cell 90 (4), 595-606 (1997)  
 PUBMED 9288740  
 REFERENCE 37 (sites)  
 AUTHORS Delphin,C., Huang,K.P., Scotto,C., Chapel,A., Vincon,M., Chambaz,E., Garin,J. and Baudier,J.  
 TITLE The in vitro phosphorylation of p53 by calcium-dependent protein kinase C--characterization of a protein-kinase-C-binding site on p53

JOURNAL Eur. J. Biochem. 245 (3), 684-692 (1997)  
 PUBMED 9183006  
 REFERENCE 38 (residues 1 to 393)  
 AUTHORS Allalunis-Turner MJ, Barron GM, Day RS 3d, Dobler KD and Mirzayans R.  
 TITLE Isolation of two cell lines from a human malignant glioma specimen differing in sensitivity to radiation and chemotherapeutic drugs

JOURNAL Radiat. Res. 134 (3), 349-354 (1993)  
 PUBMED 8316628  
 REFERENCE 39 (sites)  
 AUTHORS Baudier,J., Delphin,C., Grunwald,D., Khochbin,S. and Lawrence,J.J.  
 TITLE Characterization of the tumor suppressor protein p53 as a protein kinase C substrate and a S100b-binding protein

JOURNAL Proc. Natl. Acad. Sci. U.S.A. 89 (23), 11627-11631 (1992)  
 PUBMED 1454855  
 REFERENCE 40 (residues 1 to 393) ← B  
 AUTHORS Futreal PA, Barrett JC and Wiseman RW.  
 TITLE An Alu polymorphism intragenic to the TP53 gene

JOURNAL Nucleic Acids Res. 19 (24), 6977 (1991)  
 PUBMED 1762941  
 REFERENCE 41 (residues 1 to 393) ← B  
 AUTHORS Farrell PJ, Allan GJ, Shanahan F, Vousden KH and Crook T.  
 TITLE p53 is frequently mutated in Burkitt's lymphoma cell lines

JOURNAL EMBO J. 10 (10), 2879-2887 (1991)  
 PUBMED 1915267  
 REFERENCE 42 (residues 1 to 393) ← B  
 AUTHORS Kern,S.E., Kinzler,K.W., Bruskin,A., Jarosz,D., Friedman,P., Privves,C. and Vogelstein,B.  
 TITLE Identification of p53 as a sequence-specific DNA-binding protein

JOURNAL Science 252 (5013), 1708-1711 (1991)  
 PUBMED 2047879  
 REFERENCE 43 (residues 1 to 393)

**AUTHORS** Buchman,V.L., Chumakov,F.M., Ninkina,N.N., Samarina,O.P. and Georgiev,G.P.  
**TITLE** A variation in the structure of the protein-coding region of the human p53 gene  
**JOURNAL** Gene 70 (2), 245-252 (1988)  
**PUBMED** 2905688  
**REFERENCE** 44 (residues 1 to 393) ← B  
**AUTHORS** Harris N, Brill E, Shohat O, Prokocimer M, Wolf D, Arai N and Rotter V.  
**TITLE** Molecular basis for heterogeneity of the human p53 protein  
**JOURNAL** Mol. Cell. Biol. 6 (12), 4650-4656 (1986)  
**PUBMED** 3025664  
**REFERENCE** 45 (residues 1 to 393) ← B  
**AUTHORS** Lamb,P. and Crawford,L.  
**TITLE** Characterization of the human p53 gene  
**JOURNAL** Mol. Cell. Biol. 6 (5), 1379-1385 (1986)  
**PUBMED** 2946935  
**REFERENCE** 46 (residues 1 to 393) ← B  
**AUTHORS** McBride OW, Merry D and Givol D.  
**TITLE** The gene for human p53 cellular tumor antigen is located on chromosome 17 short arm (17p13)  
**JOURNAL** Proc. Natl. Acad. Sci. U.S.A. 83 (1), 130-134 (1986)  
**PUBMED** 3001719  
**REFERENCE** 47 (residues 1 to 393) ← B  
**AUTHORS** Harlow,E., Williamson,N.M., Ralston,R., Helfman,D.M. and Adams,T.E.  
**TITLE** Molecular cloning and in vitro expression of a cDNA clone for human cellular tumor antigen p53  
**JOURNAL** Mol. Cell. Biol. 5 (7), 1601-1610 (1985)  
**PUBMED** 3894933  
**REFERENCE** 48 (residues 1 to 393) ← B  
**AUTHORS** Zakut-Houri,R., Blenz-Tadmor,B., Givol,D. and Oren,M.  
**TITLE** Human p53 cellular tumor antigen: cDNA sequence and expression in COS cells  
**JOURNAL** EMBO J. 4 (5), 1251-1255 (1985)  
**PUBMED** 4006916  
**REFERENCE** 49 (residues 1 to 393) ← B  
**AUTHORS** Matlashewski,G., Lamb,P., Pim,D., Peacock,J., Crawford,L. and Benchimol,S.  
**TITLE** Isolation and characterization of a human p53 cDNA clone: expression of the human p53 gene  
**JOURNAL** EMBO J. 3 (13), 3257-3262 (1984)  
**PUBMED** 6396087  
**REFERENCE** 50 (sites)  
**AUTHORS** Zhukov-Verezhnikov,N.N., Anisimov,P.I., Goncharova,N.S., Bochkov,G.M. and Karaseva,Z.N.  
**TITLE** [Study of the heterogenetic antigens in vaccinal preparations of V. cholerae]  
**JOURNAL** Biull Eksp Biol Med 82 (8), 961-962 (1976)  
**PUBMED** 1088347  
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 On Jun 9, 2000 this sequence version replaced gi:4507637.  
 Summary: Tumor protein p53, a nuclear protein, plays an essential role in the regulation of cell cycle, specifically in the transition from G0 to G1. It is found in very low levels in normal cells, however, in a variety of transformed cell lines, it is expressed in high amounts, and believed to contribute to transformation and malignancy. p53 is a DNA-binding protein containing DNA-binding, oligomerization and transcription

activation domains. It is postulated to bind as a tetramer to a p53-binding site and activate expression of downstream genes that inhibit growth and/or invasion, and thus function as a tumor suppressor. Mutants of p53 that frequently occur in a number of different human cancers fail to bind the consensus DNA binding site, and hence cause the loss of tumor suppressor activity. Alterations of the TP53 gene occur not only as somatic mutations in human malignancies, but also as germline mutations in some cancer-prone families with Li-Fraumeni syndrome.

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Site 81

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ORIGIN

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